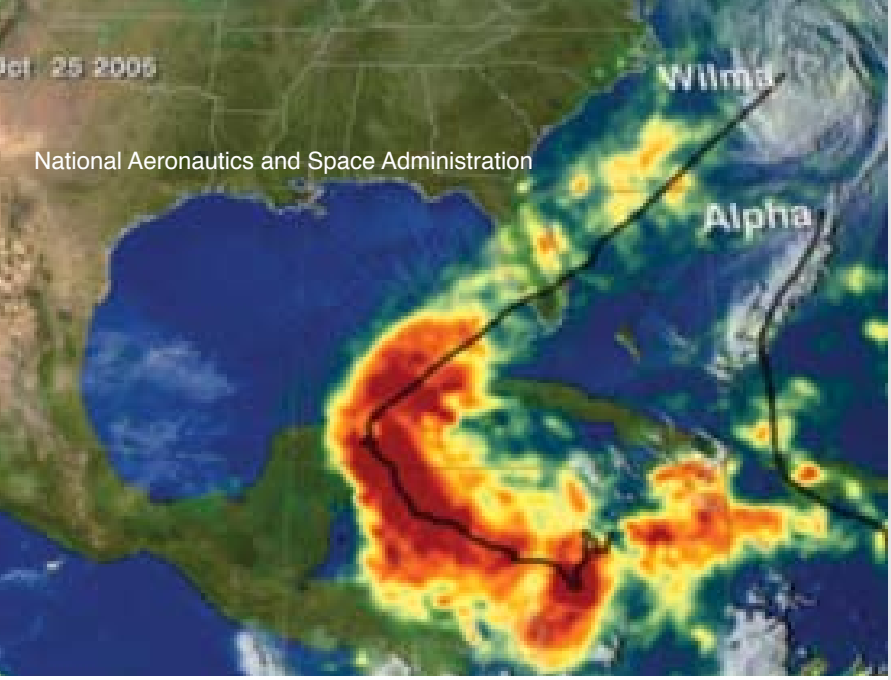

NASA Langley's

Oceanic Surface Air Pressure Sensing

Via oxygen band radar

NASA Langley has developed a novel method for long-range atmospheric pressure sensing. Based on known properties involving oxygen density, the technology is able to measure small pressure changes over a wide area. NASA developed the technology based on the known gaps currently in the area of weather forecasting as a result of the inability to accurately detect atmospheric pressure above the ocean. Oxygen band reading can be performed remotely, most likely from a satellite-based system. The technology is particularly applicable in the area of storm forecasting.

Benefits

- Predictive – The technology offers an increased measure of conditions, allowing for greater predictive capabilities.
- Safety – Using the oxygen band radar reduces or eliminates the need to send manned planes into storms to collect information.

partnership opportunity

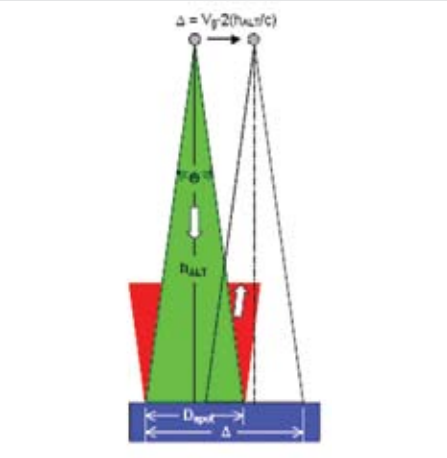

Figure 1: Use of pulsed radar for radiosonde observation (RAOB) measurement

Applications

- Weather – increased forecasting ability
- Military – short-range secret communications
- Navy – improved flight ops planning

The Technology

Understanding the characteristics of a weather system is vital to predicting the path and severity of storms such as hurricanes and typhoons. The surface air pressure over the ocean is one of the key characteristics that can be used in making those predictions. Current long-range technologies can perform only loose estimations of the surface air pressure based on wind speed and direction. Direct measurements of the air pressure require costly and risky plane missions through the storm to collect periodic data. The oxygen band radar system developed by NASA at its Langley research facility allows for the continuous remote monitoring of atmospheric pressure over the world's oceans.

The technology incorporates the use of a low-power laser frequency specific to the known oxygen band. By using this narrow band, the researchers are able to measure surface level oxygen density and subsequently, air pressure. The increased knowledge of localized air pressure will significantly enhance the predictive power of weather forecasting models and allow for the development of new models.

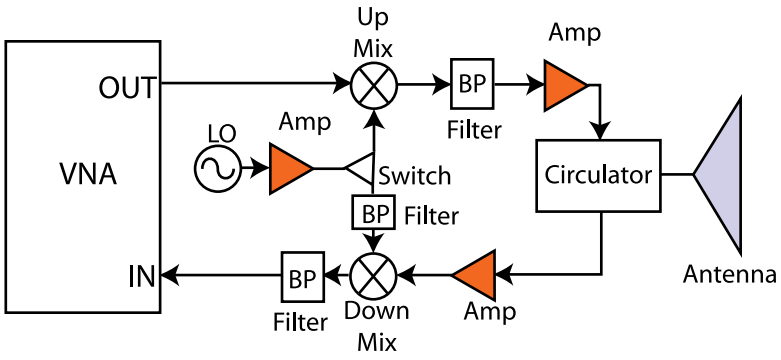

Figure 2: Diagram of the front end of the baseline radar system

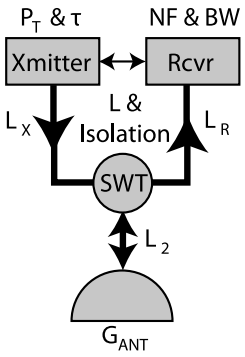

Figure 3: Basic radar components

For More Information

If your company is interested in licensing or joint development opportunities associated with this technology, or if you would like additional information on partnering with NASA, please contact:

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